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Sharp Freeze™ Lyophilizer

Sharp Vac™ Concentrator

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Sharp Vac™

Speed Vacuum Concentrators
Freeze Dryers



Spirit of Innovation

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Sharp Vac™ Speed Vacuum Concentrators

The Sharp Vac™ system consists of the Speed Vacuum concentrator, the Sharp Freeze™ lyophilizer, and ACTEvap™ parallel evaporator/freeze dryer assembled together on a convenient laboratory cart for concentrating, evaporating and/or freeze drying samples.

The Sharp Vac™ is a compact centrifuge vacuum concentrator that quickly and reproducibly concentrates peptide solutions, biological samples, chromatography fractions and small molecule libraries. The Sharp Vac™ is excellent for applications requiring rapid concentration of large numbers of samples. The centrifugal action prevents samples from bumping and foaming. Sample recovery is complete; there is no loss due to bumping or cross contamination.

The Sharp Vac™ has built-in heating that can be adjusted from +5°C to +80°C for optimal evaporation. The Sharp Vac™ also features a programmable timer function for automatic start/stop operation, vacuum measurement down to 10⁻³ mbar for monitoring leaks and sample dryness, and built in vacuum valve and safety breaker for safer running.

The Sharp Vac™ has a stainless steel interior for long life. For corrosive samples containing trifluoroacetic acid (TFA) or hydrochloric acid (HCl), optional Teflon® coating is available.



A variety of interchangeable rotors which accommodate vials, test tubes, conical bottom tubes, Eppendorf tube and titer plates, is available.



Sharp Vac™ 16
770101

Sharp Vac™ 12
770100

Rotors

	Catalog Number	Sharp Vac Model	Tube Volume	Number of Tubes	Tube Type
	770103	SV12	2ml	120	Eppendorf Tube
	770104	SV16	2ml	200	
	770105	SV12	5ml	72	Test Tube
	770106	SV16	5ml	200 (192)	
	770107	SV12	10ml	32	
	770108	SV16	10ml	98	
	770109	SV16	15ml	48	
	770110	SV16	50ml	12	
	770111	SV12	15ml	12	Conical Tube
	770112	SV12	50ml	6	
	770113	SV16	50ml	12	Vial
	770114	SV12	10ml	18	
	770115	SV12	20ml	12	
770116	SV16	20ml	30		
770117	SV16	30ml	24		
770118	SV16	8ml	60		
	770119	SV16	96 holes x 4 plates		Micro-titer Plate

Options

Option
Teflon® coating for enhanced chemical resistance

Part Number
770102

Specifications

	Sharp Vac™ 12	Sharp Vac™ 16
Part Number	770100	770101
RPM	1400	1400
Temperature Range	5°C to 80°C	5°C to 80°C
Height	12.2 inches (31cm)	12.2 inches (31cm)
Width	15 inches (38cm)	18.1 inches (46cm)
Depth	17.7 inches (45cm)	21.3 inches (54cm)
Power	230V/50 Hz, 110V/ 60 Hz	230V/50 Hz, 110V/ 60 Hz
Power Consumption	1500 W	1500 W
Material	Stainless Steel AISI 316	Stainless Steel AISI 316
Programmable Timer Control	Yes	Yes
Vacuum Valve and Safety Break	Yes	Yes

2

Sharp Vac™ Systems

Sharp Vac™ Systems consist of the Sharp Vac™ 16 speed vacuum concentrator with 200 x 1.5ml Eppendorf rotor and a Sharp Freeze™ unit to trap the evaporated solvents. All components are contained on a convenient cart for easy mobility. The lyophilization upgrade kit adds freeze drying capability, making Sharp Vac™ Systems highly versatile. For additional versatility, add ACTEvap™ units for high throughput lyophilization of compound libraries, HPLC fractions and small samples in vials.



SV16SF-110



SV16SF-110 with Freeze Dryer Upgrade



Sharp Vac™ System with ACTEvap™

Specifications

System	Part Number	Description
SV16SF-55	770200	SharpVac™ 16, 4L Sharp Freeze™-55, including microprocessor, connection kit, 200 x 1.5ml Eppendorf rotor, Rack, and connection kits
SV16SF-110	770201	SharpVac™ 16, 4L Sharp Freeze™-110, including microprocessor, connection kit, 200 x 1.5ml Eppendorf rotor, Rack, and connection kits
SV16SF-55 9L	770202	SharpVac™ 16, 4L Sharp Freeze™-55 9 Liter, including microprocessor, connection kit, 200 x 1.5ml Eppendorf rotor, Rack, and connection kits
Upgrade Kit	770203	Upgrades SV16 to freeze drying and vacuum concentration in one with four ¾ inch quick seal valves and connection kits. For use with all Sharp Vac accessories
Add ACTEvap™	990212	ACTEvap™ 35 well, 4ml multi-vial

3

Lyophilizer and Cold Trap - Sharp Freeze™ Freeze Dryer

The Sharp Freeze™ is a flexible, compact lyophilizer with unsurpassed reliability and performance. The Sharp Freeze™ also doubles as the low temperature condenser trap of the Sharp Vac™ system.

The Sharp Freeze™ -110 produces and maintains a constant lower vacuum pressure, increases lyophilization efficiency and can trap most organic solvents at -110°C, including acetonitrile, thus ensuring a longer working life of the vacuum pump. The Sharp Freeze™ -55 maintains a constant low working temperature of -55°C, suitable for lyophilizing samples dissolved in water only.

The Sharp Freeze™-110 has dual compressors for greater efficiency and includes a step start feature to preserve the life of the compressors and maintain a constant temperature at the various stages of operation.

The 4-Liter condenser chamber is constructed of seamless stainless steel for easy leak-free operation, and easy, fast cleaning. Optional Teflon® coating makes the condenser chamber resistant to acids. A special glass trap is available for trapping highly corrosive chemicals. The optional electric de-ice function provides rapid de-icing of the condenser for faster processes.

The Sharp Freeze™ -55 9-Liter has the same features, compact footprint and durable construction as the 4-Liter models, but with greater capacity. The large 9-Liter condenser has a cooling capacity of 4kg/24 hours and a total drying volume up to 7 Liters. An optional electric de-ice function is available for rapid de-icing of the condenser.

Cold Trap

Both the Sharp Freeze™ -55 and the Sharp Freeze™ -110 can be used as a trap by replacing the freeze dryer manifold with a cooling trap lid (770317).



Freeze Dryer 770300 Cold Trap 770301



Glass Insert 770302



Sharp Freeze™ -55 4-Liter 770303



Sharp Freeze™ -55 9-Liter 770304

Specifications

	Sharp Freeze™ -55 4-Liter (For high boiling solvents)	Sharp Freeze™ -110 4-Liter (For low boiling solvents)	Sharp Freeze™ -55 9-Liter (For low boiling solvents)
Part Number	770301	770300	770304
Ultimate Temperature	-55°C	-110°C	-55°C
Total Volume	4L	4L	9L
Height	21 inches (53cm)	21 inches (53cm)	21 inches (53cm)
Width	15.75 inches (40cm)	15.75 inches (40cm)	15.75 inches (40cm)
Depth	20 inches (50cm)	20 inches (50cm)	20 inches (50cm)
Cooling Capacity	2kg/hour	2kg/hour	4kg/hour
Power	115 V / 60 Hz	115 V / 60 Hz	115 V / 60 Hz
Power Consumption	200 W	400 W	400 W
Condenser Material	Stainless Steel AISI 316	Stainless Steel AISI 316	Stainless Steel AISI 316
Weight	88 pounds (40kg)	121.25 pounds (55kg)	99 pounds (45kg)
Microprocessor Control	Yes	Yes	Yes
Overload and Malfunction Alarms	Yes	Yes	Yes
Compressor Start Delay	Yes	Yes	Yes

Options for the Sharp Freeze™-55/4L and Sharp Freeze™-110/4L

Option	Part Number
Electric De-ice Function for rapid de-icing of the condenser	770305
Teflon® Coating of the Sharp Freeze™ -110 condenser	770306
Glass Insert with Lid	770307
Extra Glass Insert	770302

Sharp Freeze™ -55 Digital / Sharp Freeze™ -110 Digital

The Sharp Freeze™-55 Digital and Sharp Freeze™-110 Digital have the same features as the Sharp Freeze™-55 and Sharp Freeze™-110, but include built-in vacuum sensing to 0.001 mbar, digital readout and USB port for optional data logging.

The Sharp Freeze™-55 Digital and Sharp Freeze™-110 Digital can be easily connected to Heated Chamber 770309 for faster, reproducible freeze-drying. The Sharp Freeze Digital can program up to 15 steps and can store up to 5 programs. In addition, vacuum regulation can be added to further optimize lyophilization rates.

Optional software is available to monitor all parameters and log them in an Excel spreadsheet for full documentation. Results are displayed on a scalable curve for easy monitoring of the lyophilization process.



Sharp Freeze™-110 Digital 770308

Equipped with Heated Chamber 770309

Specifications

	Sharp Freeze™ -55 Digital (For high boiling solvents)	Sharp Freeze™ -110 Digital (For low boiling solvents)
Part Number	770310	770308
Ultimate Temperature	-55°C	-110°C
Total Volume	4L	4L
Height	21 inches (53cm)	21 inches (53cm)
Width	15.75 inches (40cm)	15.75 inches (40cm)
Depth	20 inches (50cm)	20 inches (50cm)
Cooling Capacity	2kg/hour	2kg/hour
Power	115 V / 60 Hz	115 V / 60 Hz
Power Consumption	200 W	400 W
Condenser Material	Stainless Steel AISI 316	Stainless Steel AISI 316
Weight	88 pounds (40kg)	121.25 pounds (55kg)
Microprocessor Control	Yes	Yes
Overload and Malfunction Alarms	Yes	Yes
Compressor Start Delay	Yes	Yes
Digital Readout	Yes	Yes
Pressure Gauge	Yes	Yes
USB Port	Yes	Yes

Options for the Sharp Freeze™-55 Digital / Sharp Freeze™-110 Digital 4-Liter

Option	Part Number
Electric De-ice Function for rapid de-icing of the condenser	770305
Teflon® Coating of the Sharp Freeze™ -110 condenser	770306
Glass Insert with Lid	770307
Extra Glass Insert	770302
Pressure Regulation	770311
Product Sensor	770312
Data Logging Software	770313

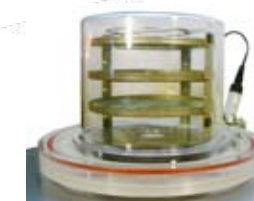
Sharp Freeze™ -55 9-Liter Sharp Freeze™ -55 Digital 9-Liter

The Sharp Freeze™-55 9-Liter and Sharp Freeze™-55 Digital 9-Liter have the same features, compact footprint and durable construction as the 4-Liter models, but with greater capacity. The large 9-Liter condenser has a cooling capacity of 4kg/24 hours and a total drying volume up to 7 liters. An optional electric de-ice function is available for rapid de-icing of the condenser.



Sharp Freeze™ -55 9-Liter
770314

The 9-Liter condenser can also be utilized to freeze samples for lyophilization. Samples can be loaded into the rack from the 20cm D vacuum chamber (770315) and the rack placed inside the condenser for freezing, then removed and placed in the vacuum chamber for freeze drying. Sample freezing and lyophilization are performed with the same equipment, a separate freezing unit is not necessary.



20cm Vacuum Chamber
770315



20cm Vacuum Chamber Rack in
Sharp Freeze™ -55 9-Liter
Condenser

Specifications

	Sharp Freeze™ -55 9-Liter (For low boiling solvents)	Sharp Freeze™ -55 Digital 9-Liter (For low boiling solvents)
Part Number	770314	770316
Ultimate Temperature	-55°C	-55°C
Total Volume	9L	9L
Height	21 inches (53cm)	21 inches (53cm)
Width	15.75 inches (40cm)	15.75 inches (40cm)
Depth	20 inches (50cm)	20 inches (50cm)
Cooling Capacity	4kg/hour	4kg/hour
Power	115 V / 60 Hz	115 V / 60 Hz
Power Consumption	400 W	400 W
Condenser Material	Stainless Steel AISI 316	Stainless Steel AISI 316
Weight	99 pounds (45kg)	121 pounds (55kg)
Microprocessor Control	Yes	Yes
Overload and Malfunction Alarms	Yes	Yes
Compressor Start Delay	Yes	Yes
Digital Readout	No	Yes
Pressure Gauge	No	Yes
USB Port	No	Yes

Options for the Sharp Freeze™-55 9-Liter

Option	Part Number
Electric De-ice Function for rapid de-icing of the condenser	770305

Options for the Sharp Freeze™-55 Digital 9-Liter

Option	Part Number
Electric De-ice Function for rapid de-icing of the condenser	770305
Pressure Regulation	770311
Product Sensor	770312
Data Logging Software	770313

Sharp Freeze™ -55 60-Liter Sharp Freeze™ -85 60-Liter

The Sharp Freeze™ -55 60-Liter and Sharp Freeze™ -85 60-Liter are compact freestanding floor lyophilizers in a frame-supported cabinet. The condenser is constructed of seamless 316L stainless steel for chemical resistance. The condenser is designed for easy inspection during the freeze drying process. The cooling coil is placed around the outside of the condenser to allow easy removal of ice and cleaning of the condenser.



Features

- Fast and reproducible freeze drying with a large capacity of 8kg of ice per 24 hours
- 60 liter condenser will take maximum loads of 20kg of ice
- The large ice capacity gives faster freeze drying and avoids overloading or product melting
- Convenient operation from the front
- Strong and reliable floor model
- Choose from condenser temperature -55 or -85°C.
- Accommodates all Sharp Freeze™ chambers and manifolds
- Accommodates 14 port 3/4 inch manifold
- Digital readout of condenser temperature
- Protective step-start of compressors
- Vacuum release
- Built-in de-icer
- Separate vacuum valve

Options

- Option**
- Sharp Freeze™ -55 60-Liter Basic -55°C condenser temperature and connection kit
 - Sharp Freeze™ -85 60-Liter Basic -85°C condenser temperature and connection kit
 - 14 Port Manifold with 14 quick seal valves

- Part Number**
- 770400
 - 770401
 - 770402



14 Port Manifold
770402

Specifications

	Sharp Freeze™ -55 60-Liter	Sharp Freeze™ -85 60-Liter
Volume	60L	60L
Condenser Capacity	8kg ice per 24 hours	8kg ice per 24 hours
Condenser Surface Area	0.6 m ³	0.6 m ³
Temperature	-55°C	-85°C
Pressure Measurement Range	1000 mbar to 0.001 mbar	1000 mbar to 0.001 mbar
Air-cooled Compressor	1000 W	1000 W
CFC-free Refrigerant	R507/R507/R1150	R507/R507/R1150
Max. Energy Consumption	2000 W	2000 W
Noise Level	<55 dB(A)	<55 dB(A)
Height	43.5"	43.5"
Width	30"	30"
Depth	26"	26"
Weight	660 lbs	660 lbs
Power	3 x 400 V/50 Hz or 220 V/50 Hz	3 x 400 V/50 Hz or 220 V/50 Hz
Drip Tray on Top	Yes	Yes
Electrical De-Ice System 750W	Yes	Yes
Vacuum Break System Solenoid Valve	Yes	Yes

Sharp Freeze™ -55 60-Liter Advanced Sharp Freeze™ -85 60-Liter Advanced

Features

- Includes 2 shelves, 30 x 30cm in condenser
- Maximum 5 shelves
- Shelf control temperature range: <-45 to +50°C (SF55-60), <-70 to +55°C (SF85-60)
- Automatic pre-freeze and freeze drying in one
- Accommodates 14 port manifold
- Shelf cooling by and within condenser
- Programmable microprocessor controller
- LCD read-out of vacuum and condenser, shelves and product temperatures
- Precise monitoring of the vacuum from 1000 mbar to 10⁻³ mbar
- Multi-system with manual override for manual operation
- Built-in heat programmer
- Built-in electric quick defrost
- Built-in Vacuum Break Device
- Built-in Anti Suck-back Device for vacuum pump
- Choice of -55°C and -85°C models



Options

- Option**
- Sharp Freeze™ -55 60-Liter Advanced -55°C condenser temperature, microprocessor 2 shelves and connection kit
 - Sharp Freeze™ -85 60-Liter Advanced -85°C condenser temperature, microprocessor 2 shelves and connection kit
 - 14 Port Manifold with 14 quick seal valves
 - Additional Shelves - Electrically heated 30 x 30cm shelves (3 extra max)
 - Additional Tray - Stainless steel 30 x 30 x 1.5cm
 - Product Sensor - Product sensor for SF 55-60/85-60 Advanced

- Part Number**
- 770400
 - 770401
 - 770402
 - 770403
 - 770405
 - 770312

Sharp Freeze™ -55 60-Liter Top Advanced Sharp Freeze™ -85 60-Liter Top Advanced

Features

- Includes 3 shelves, 30 x 30cm in condenser
- Maximum 5 shelves
- Shelf control temperature range: <-45 to +50°C (SF55-60), <-70 to +55°C (SF85-60)
- Automatic pre-freeze and freeze drying in one
- Accommodates 14 port manifold
- Shelf cooling by and within condenser
- Programmable microprocessor controller
- LCD read-out of vacuum and condenser, shelves and product temperatures
- Precise monitoring of the vacuum from 1000 mbar to 10⁻³ mbar
- Multi-system with manual override for manual operation
- Built-in heat programmer
- Built-in electrical quick defrost
- Built-in Vacuum Break Device
- Built-in Anti Suck-back Device for vacuum pump
- Choice of -55°C and -85°C models



Options

Option

- Sharp Freeze™ -55 60-Liter Top Advanced -55°C condenser temperature, microprocessor, 2 shelves and connection kit
- Sharp Freeze™ -85 60-Liter Top Advanced -85°C condenser temperature, microprocessor, 2 shelves and connection kit
- 14 Port Manifold with 14 quick seal valves
- Additional Shelves - Electrically heated 30 x 30cm shelves (3 extra max)
- Additional Tray - Stainless steel 30 x 30 x 1.5cm
- Product Sensor - Product sensor for SF 55-60/85-60 Advanced

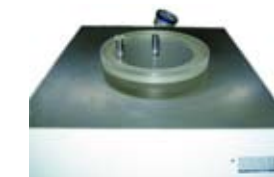
Part Number

- 770405
- 770406
- 770402
- 770403
- 770404
- 770312

Accessories

Cooling Trap Lid (770317)

Converts the Sharp Freeze™-110 to a low temperature cold trap for laboratory vacuum systems.



Cooling Trap Lid
770317

Lyophilizer Lid (770318)

Acrylic baseplate for the freeze dryer manifold and vacuum chamber. Plate includes connectors for vacuum pump and vacuum release.



Lyophilizer Lid
770318

Freeze Dryer Manifold (770319)

4-branch tree manifold allows up to 4 connections to the Sharp Freeze™ -110. Fitted with 3/4 inch rubber valves for connection to flasks, the ACTEvaps™ or other equipment.



Freeze Dryer Manifold
770319

Manifold Addition (770320)

The manifold addition adds 4 additional ports to the Freeze Dryer Manifold (770319). Each port is equipped with 3/4 inch rubber valves.



Manifold Addition
770320

Lyophilization Flasks

These flasks can be utilized for shelf freeze-drying or as small vacuum chambers. Each flask is constructed of strong, thick-walled glass and is fitted with a vacuum tight rubber lid. A stainless steel connector included with each flask allows easy attachment to the 3/4 inch rubber manifold valves.

- 150ml Flask (770321)
- 300ml Flask (770322)
- 600ml Flask (770323)
- 1200ml Flask (770324)



770322

770323

770324

Glass Insert with Lid (770307)

For trapping highly corrosive compounds. Fits 4-Liter condenser of 770301, 770300, 770310 and 770308

- Spare Insert (770302)



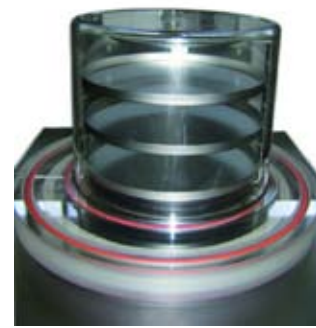
Glass Insert
770307

Vacuum Chambers

20cm Vacuum Chamber (770315)

This strong, compact acrylic chamber allows many samples to be freeze-dried simultaneously in up to 6 trays. Chamber includes stainless steel rack, 2 stainless steel shelves and 2 stainless steel trays. Chamber Dimensions: 21cm H x 20cm D

- Extra Shelf for Product Tray (770325)
- Extra Product Tray (770326)

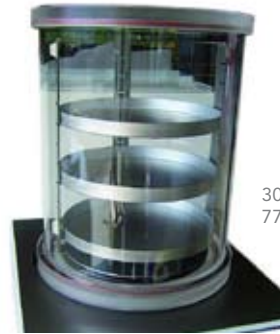


20cm Vacuum Chamber
770315

30cm Vacuum Chamber (770327)

This large acrylic chamber holds up to 10 trays for maximum freeze drying capacity. The chamber includes a stainless steel rack, 3 stainless steel shelves and 3 stainless steel trays.

- Extra Shelf for Product Tray (770328)
- Extra Product Tray (770329)



30cm Vacuum Chamber
770327

Vacuum Chamber with 4 Port Manifold (770330)

This chamber is the same as the 30cm D vacuum chamber, but with four 3/4 inch rubber valves at the top for attaching additional accessories. The chamber comes with 3 stainless steel shelves and accommodates up to 10 trays.

- Extra Shelf for Product Tray (770328)
- Extra Product Tray (770329)



Vacuum Chamber
with 4 Port Manifold
770330

Vacuum Chamber with 8 Port Manifold (770331)

This chamber is the same as the 30cm D vacuum chamber, but with four 3/4 inch rubber valves at the top for attaching additional accessories. The chamber comes with 3 stainless steel shelves and accommodates up to 10 trays.

- Extra Shelf for Product Tray (770328)
- Extra Product Tray (770329)



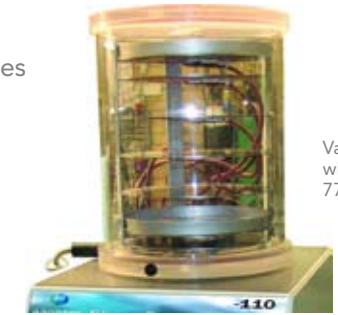
Vacuum Chamber
with 8 Port Manifold
770331

Vacuum Chambers (continued)

Vacuum Chamber with Shelf Heating (770332)

This large acrylic chamber has 6 electrically heated stainless steel shelves for faster, more uniform freeze drying results. It may be utilized with Sharp Freeze™ Digital units without additional controls. To utilize this chamber with standard Sharp Freeze™ units, a temperature controller or multicontroller is required to regulate shelf heating.

- Extra Product Tray (770329)



Vacuum Chamber
with Shelf Heating
770332

Vacuum Chamber with 4 Port Manifold and Shelf Heating (770333)

Same as above but with four 3/4 inch rubber valves at the top for attaching additional accessories.

- Extra Product Tray (770329)

Vacuum Chamber with 8 Port Manifold and Shelf Heating (770334)

Same as above but with eight 3/4 inch rubber valves at the top for attaching additional accessories.

- Extra Product Tray (770329)

Temperature Controller (770335)

The Temperature Controller regulates the heating of all shelves by maintaining a constant temperature on one shelf. The controller features one step programming and digital temperature readout. Controls up to 6 heated shelves. **Not required for Sharp Freeze™ Digital models.**



Temperature
Controller
770335

Advanced Temperature Controller (770336)

The Advanced Temperature Controller accurately controls the heating of six shelves individually so that the highest uniformity and reproducibility will be maintained. Utilizes one product sensor. Optional data recording available. **Not required for Sharp Freeze™ Digital models.**



Advanced
Temperature
Controller
770336

- Product Sensor (770312)

Vacuum Chambers (continued)

Multicontroller (770337)

The Multicontroller is utilized with standard Sharp Freeze™ units to monitor condenser temperature and vacuum level down to 0.001 mbar. An optional pressure regulator is available. An optional USB port can be added for computer communication and data logging. **Not required for Sharp Freeze™ Digital models.**

- **Pressure Regulation Option (770311)**
- **Optional USB Port (770338)**

Data Logging Software (770313)

Optional software monitors all parameters and logs them in an Excel spreadsheet for full documentation. Results are displayed on a scalable curve for easy monitoring of the lyophilization process. For use with Advanced Temperature Controller (770336), Multicontroller (770337) and Sharp Freeze™ Digital models.

ACTEvap™

The ACTEvap™ is a compact parallel evaporator and lyophilizer that can be utilized with the Sharp Freeze™ or Sharp Vac™ system. Connected to the Sharp Freeze™ and a vacuum pump, the ACTEvap™ is ideal for simultaneously concentrating many fractions from HPLC purification, flash chromatography or column chromatography; for preparing compound libraries; or for evaporating samples in storage vials instead of expensive flasks. No sample, or time, is lost in transferring from flask to vial.

The ACTEvap™ can evaporate or lyophilize up to 35 samples simultaneously. Utilizing a special permeable vial cap, the ACTEvap™ creates a two-stage vacuum that reduces or eliminates “bumping”. No product is lost from splattering due to bumping and there is no cross contamination. The contents of each vial remain totally isolated.

Using different inserts, the ACTEvap™ can accommodate a variety of vial sizes or test tubes. aappTEC can custom manufacture inserts to accommodate special vial sizes or configurations.

The ACTEvap™ is easy and economical to use. The ACTEvap™ uses inexpensive vials; the special vial caps are reusable.

The ACTEvap™ is constructed of a rugged, chemically inert, thermally conductive Teflon® composite. It requires very little maintenance, merely check the two Viton® seals and wash out the interior to maintain the ACTEvap™ in top operating condition.

ACTEvap™ Parallel Evaporator/Lyophilizer

Option	Part Number
35 well, 4ml multi-vial	990212
24 well, 4ml multi-vial	990211
24 well, 7.4ml multi-vial	990210
16 well, 22ml multi-vial	990209
10 well, 20ml multi-vial	990208
10 well, 40ml multi-vial	990207



Vacuum Pumps

Rotary Vane Vacuum Pumps

These pumps are compact and quiet, and can reach an ultimate pressure of 2×10^{-3} mbar. They have a high water vapor tolerance of 60 mbar and are ideally suited for laboratory use. They require little maintenance and can easily be wiped clean.

- Ultimate pressure: $2.0 \cdot 10^{-3}$ mbar, Pumping speed: 7.2 m³/h PK8
- Ultimate pressure: $2.0 \cdot 10^{-3}$ mbar, Pumping speed: 11.0 m³/h PK12
- Ultimate pressure: $1.0 \cdot 10^{-2}$ mbar, Pumping speed: 1.8 m³/h PK2
- Ultimate pressure: $2.0 \cdot 10^{-3}$ mbar, Pumping speed: 5.8 m³/h PK6

Vacuum Pumps

PK12
AAP302313 (230v.)
AAP302313-03 (115v.)



PK6
AAP302100 (230v.)
AAP302100-03 (115v.)



PK2
AAP302010 (230v.)
AAP302010-03 (115v.)



PK8
AAP302101 (230v.)
AAP302101-03 (115v.)